#35 G

SEQUENCE LISTING

<110> Farrar, Gwenyth Jane
Humphries, Peter
Kenna, Paul

<120> Genetic Suppression and Replacement

<130> MUR-003

<140> 09/155,708
<141> 1999-04-05

<150> PCT/GB97/00929
<151> 1997-04-02

<150> GB9606961.2
<151> 1996-04-02

<160> 34

<170> PatentIn version 3.1

<210> 1
<211> 617
<212> DNA
<213> Artificial Sequence

<220>
<223> The human rhodopsin cDNA cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(617)
<223> n is any nucleotide

<400> 1
tcccttntgn tagattgcan nncccaataa aanaaggncc cgcttaaagg cttatcgaaa 60

ttaatacgac tcactatang gagacccaag cttagagtca tccagctgga gccctgagtg 120

gctgagctca ggccttcgca gcattcttgg gtgggagcag ccacgggtca gccacaaggg 180

ccacagccat gaatggcaca gaaggcccta acttctacgt gcccttctcc aatgcgacgg 240

gtgtggtacg cagccccttc gagtacccac agtactacct ggctgagcca tggcagttct 300

ccatgctggc cgcctacatg tttctgctga tcgtgctggg cttccccatc aacttcctca 360

cgctctacgt caccgtccag cacaagaagc tgcgcacgcc tctcaactac atcctggctc 420

aacctagccg tggctgaact cttcatggtc ctangtggct tcaccagcac ctctacanct 480

ctctgcatgg atactcgtct tcgggcccac aggatgcaat tgganggctc tttgcacctg 540

gngggaaatt gcctgtggtc ctngtggtcn ggncaccaac gtactggtng tgtntanccc 600

agaacaactc cgctccc 617

<210> 2
<211> 639
<212> DNA
<213> Artificial Sequence

<220>
<223> The human rhodopsin hybrid cDNA with a C-->G change at nucleotide 271

<220>
<221> misc_feature
<222> (1)..(639)
<223> n is any nucleotide

<400> 2
ggnnnnttgg gtcgcgcatt naagaactca nggncccgca gcattcttgg gtgggagcag 60

ctacgggtca gccacaaggg ccacagccat gaatggcaca gaangcccta acttctacgt 120

gcccttctcc aatgcgacgg gtgtggtacg cagccccttc gagtacccac agtactacct 180

ggctgagcca tggcagttct ccatgctggc cgcctacatg tttctgctga tcgtgctggg 240

cttccccatc aacttcctca cgctctacgt gaccgtccag cacaagaagc tgcgcacgcc 300

tctcaactac atcctgctca acctanccgt ggntgaactc ttcatggtcc taggtggctt 360

caccancaac ctctanacct ctctgcatgg anacttcntc ttccggccca caggatgcaa 420

tttggaaggn ttcctttaac acccgggggg ggaaaattgc ctgtggtcct tggtggtccg 480

gncancnaac ggtacttgtg gtntttaanc cataaacaat tccgcttcgg gaaaaacatg 540

ccancntggg gtttccttca ctnggttang ggcnggctgc ccccacccca atcccnggtn 600

gtcaantaat cccaagggcn nantgncntt ttaaacaaa 639

<210> 3
<211> 686
<212> DNA
<213> Artificial Sequence

<220>
<223> A human rhodopsin adRP mutation, a C-->T change at nucleotide 217

<220>
<221> misc_feature
<222> (1)..(686)
<223> n is any nucleotide

<400> 3
nnnttagggn cggatgtcna tataagcaga nctctctggg ctaactaana agaacccact 60

ggcttactgg cttatcgaaa ttaatacgac tcactatagg gagacccaag cttccggaaa 120

gcctgagctc agccacaagg gccacagcca tgaatggcac agaaagccct aacttctacg 180

tgcccttctc caatgcgacg ggtgtggtac gcagcctctt cgagtaccca cagtactacc 240

tggctgagcc atggcagttc tccatgctgg ccgcctacat gtttctgctg atcgtgctgg 300

gcttccccat caacttcctc acgctctacg tcaccgtcca gcacaagaag ctgcgcacgc 360

ctctcaacta catcctgctc aacctanccg tggctgaact cttcatggtc ctangtggct 420

tcaccancac cctctacacc tctctgcatg gatacttcgt cttccgggcc acaggatgca 480

atttggaagg cttctttgca ncctgggncg ggaaattgcc tgtngtcctg gtggtcctgg 540

ccatcaacng tacttgttgt ntnttaccca tnaacaattc cgctccggga aaacatgcac 600

atgggnttgc ctcactnggt ctggggcngg cnccccaccc caccccggt ggtcanttat 660

cccanggcgn aatgcctttn annaaa 686

<210> 4
<211> 787
<212> DNA
<213> Artificial Sequence

<220>
<223> A hammerhead ribozyme (termed Rz10) cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(787)
<223> n is any nucleotide.

<400> 4
cngcncgttg aaatataagc agaccctctg gntaactana ataaccactg cttactggct 60

tatcgaaatt aatacgactc actatangga gaccaagctt ggtcggtctg atgagtccgt 120

gaggacgaaa cgtagagtct anagggccct attctatagt gtcacctaaa tgctaganct 180

cgctgatcag cctcgactgt gccttctagt tgccagccat ctgttgtttg cccctccccc 240

gtgccttcct tgancctgga aggtgccact cccactgtcc tttcctaata aaatgagnaa 300

ttgcntctca ttgtctgagt agtgtcatcc aatctggggg tgggtggggc agnacacnag 360

gggaagatgg gaaaacatac aggcatgctg gggangccgt ggntctatgn ctcngaggcg 420

aaaaaacact ggggnctagg ggtaccccac cccctgtacg gccataacnc gnggtttgtg 480

gtacccacta acgtanntgc accctacccg ncttcnttct cctcttncca tttccggttc 540

cctcaccnaa cgggccttng tcatatctng gnccaccaaa tanagtagtc tttgccccca 600

aagtccctna tgacctntaa gaccttcann ancccccctt ntttnaaana nccnnnnnnn 660

nnnnannnnc cngnaaaaan aacaactaat tttgggaacc ccccccnana aacccttttcc 720

ntnttccccc natttaatnt tnnnntnccc ccccccccccc ccccnntttt tnncnccccn 780

nnannng 787

<210> 5
<211> 665
<212> DNA
<213> Artificial Sequence

<220>
<223> A hammerhead ribozyme (termed Rz20) cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(665)
<223> n is any nucleotide.

<400> 5
nnccccgccc ntttnaaana anccnagcct ctggcnaact ananaaccac tgcttactgg 60

cttatcnaaa ttaatacgac tcactatagg gagacccaag ctttactcga actgatgagt 120

ccgtgaggac gaaaggctgc tctananggc cctattctat antgtcacct aaatgctaga 180

gctcgctgat cagcctcgac tgtgccttct aattgccagc catctgttgt ttgcccctcc 240

cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta ataaaatgaa 300

gatnttncat cncattgtct gagtaagtgt cattctattc tgggggggtgg ggtggggcac 360

gacancaang gggaagattg ggaaaaaata ncaggcntgc tggggatncc gtgggctcta 420

tngcttctga agcggaaaaa acaactgggg ctctangggg tatccccccc cccctgtaac 480

gngcattaaa cncgggggtg ttgtggttac cccaacttaa cgctancttg caacgcccna 540

acgccccncc tttcctttct cccttccttc ncccactttc cgggttcccn tcaacccnaa 600

tcggggcccc ttaggtccaa ttatgcttcg gccccncccn aaactaatag gtnggttctt 660

tngcc 665

<210> 6
<211> 624
<212> DNA
<213> Artificial Sequence

<220>
<223> Mouse rhodopsin cDNA cloned into pCDNA3

<220>
<221> misc_feature
<222> (1)..(624)
<223> n is any nucleotide.

<400> 6
nnnnctttnct tanngcttgg taccganctc ggatccacta gtnaacggcc gccagtgtgc 60

tggaaattcc cagaggnact ctggggcaga caagatgaga caccctttcc tttctttacc 120

taagggcctc cacccgatgt caccttggcc cctctgcaag ccaattaggc cccggtggca 180

gcagtgggat tagcgttagt atgatatctc gcggatgctg aatcagcctc tggcttaggg 240

agagaaggtc actttataag ggtctggggg gggtcagtgc ctggagttgc gctgtgggag 300

ccgtcagtgg ctgagctcgc caagcagcct tggtctctgt ctacgaaaan cccgtggggc 360

agcctcnana accgcagcca tgaacggcac agaaggcccc aatttttatg tgcccttctc 420

caacgtcaca ngcgtggtgc ggaacccctt cnancanccg cagtactacc tggcggaacc 480

atggcagttc tccatgctgg cancgtacat gtcctgctca tcgtgctggg nttcccatca 540

actcctcacg ctctagttca ccgtaaanna naaaaaactg cgcaacccct caactaaatc 600

ctgctcaatt gggcgtgggt gaac 624

<210> 7
<211> 630
<212> DNA
<213> Artificial Sequence

<220>
<223> Mouse rhodopsin hybrid cDNA with a T-->C change at nucleotide 190

<220>
<221> misc_feature
<222> (1)..(630)
<223> n is any nucleotide.

<400> 7
nnnntcttcc nctttcgttt gttgnanant cannaaanan aggcgncccg gaaggtgtca 60

gtgcctggag ttgcgctgtg ggacccgtca ntggctgagc tcgccaagca gccttggtct 120

ctgtctacga agagcccgtg gggcagcctc gagagccgca gccatgaacg gcacagaggg 180

ccccaatttc tatgtgccct tctccaacgt cacaggcgtg gtgcggagcc ccttcgancn 240

tccgcagtac tacctggcgg aaccatggca gttctccatg ctggcagcgt acatgttcct 300

gctcatcgtg ctgggcttcc ccatcaactt cctcacgctc tacgtcaccg tacagcacaa 360

gaagctgcgc acacccccctc aactacatcc tggctcaact tgggccgntg ggnttggaac 420

ctccttccca ttgggtcntt cccggaangg antncaccaa ccacccctct aacacatcaa 480

ctcccatggg ctacttcgtt cttttggggc ccncaggctg ttaatctcga agggcttctt 540

tgccacacct tggaagtgaa atcnccctgt ggttccctgg tggtcntggc cattaacgct 600

acttgtggtc ctgcaaccca ataacaattc 630

<210> 8
<211> 649
<212> DNA
<213> Artificial Sequence

<220>
<223> A hammerhead ribozyme (termed Rz33) cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(649)
<223> n is any nucleotide.

<400> 8
tcccctnntt tttgtagcnc tgccaanaaa aaaggccagc tcacaggana antananaac 60

ccactgctta ctggcttanc naaattaata cgactcacta tagggagacc caagcttggc 120

acatctgatg agtccgtgag gacgaaaaaa ttggtctaca gggccctatt ctataatgtc 180

acctaaatgc tanagctcgc tgatcatcct cnactgtgcc ttctacttgc cagccntctn 240

ttgtttgccc ctccccccgtg ccttccttga ccctggaagg tgccactccc actgtccttt 300

cctaataaaa tgaggaaatt gcatcgcatt gtctgagtaa gtgtcattct attctggggg 360

gtggggtggg gcaggacnnc aaaggggaag attgggaaat acaatancca aggancnctc 420

ccccngggta attgcggatt nggctctntc gcttccttaa ggcngaaana aacaactngg 480

gcgctncggg gtttcccccn cccncccctnt tagcngcgca ttantcgccg cgggtgttgt 540

tgttactccc cacctnaacg ctacanttgc cagcgcctaa cgcccccccct tnctnttctt 600

ccctcctttc tcncacttcc ccggctttcc ccnccaancc naaatcngg 649

<210> 9
<211> 681
<212> DNA
<213> Artificial Sequence

<220>
<223> Human peripherin cDNA cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(681)
<223> n is any nucleotide.

<400> 9
nnttgttggt ncagtnggat gtctatataa gcagagnctc tggctaacta gnagaaccca 60

ctgcttactg gcttatcgaa attaatacga ctcactatag ggagacccaa gcttggtacc 120

gagctcngat ccactagtaa cggccgccag tgtgctggaa ttcttcagcg cccacgacca 180

gtgactatcc cctgctcaag ctgtgattcc gagacccctg ccaccactac tgcattcacg 240

ggggatccca ngctaatggg actcgacatg ggttgccccc acggcanctc cctacanctt 300

gggccanctn cacttttccc aaagncctaa atctccgcct ctcggctcnt taangttngg 360

ggtgggganc tgtgctgtgg gaaacaaccc agaananact tgggcagcat ggngctactg 420

aaagtncatt ttgaacagaa naaacggtcc antttggccc aaggnncnng ntcctaaant 480

ggttctccnt ntttggtngn ntccncnctt tccncctngg aatgttcctg aaaaattnaa 540

cnccaaaaaa gaacaaattg aaaaatantt ctnaaaaccc ttttgttncc ccccccccna 600

aaagggaagg ggnnggnncc ttttttnttcc ccccccgggg ggggaaaatt ttnnnnaanc 660

ccccccccc ccnttttttn a 681

<210> 10
<211> 612
<212> DNA
<213> Artificial Sequence

<220>
<223> Human peripherin hybrid DNA with a A-->G change at nucleotide 332

<220>
<221> misc_feature
<222> (1)..(612)
<223> n is any nucleotide.

<400> 10
ttatacnaca cactatangg agaccaagct tggtaccgag ctcggatcca ctagtaacgg 60

ccgccagtgt gctggaattc ttcancgccc aggaccagga ctatcccctg ctcaagctgt 120

gattccgaga cccctgccac cactactgca ttcacggggg atcccaggct agtgggacnc 180

gacatgggta tcccccaggg cagctcccta cagcttgggc catctgcact tttcccaagg 240

ccctaagtct ccgcctctgg gctcgttaan gtntggggtg ggagctgtgc tgtgggaaac 300

aacccggact acacttggca agcatggcgc tgctgaaagt caagtttgaa cagaaaaaan 360

gggtcaagtt ggcccaaggg ctctggctca gggaaactgg gttncccncc nngttttngg 420

tttggntgca tcanctncca aaaanannnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 480

nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 540

nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 600

nnnnnnnnnn nn 612

<210> 11
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward 257 mutation primer

<400> 11
catggcgctg ctgaaagtca 20

<210> 12
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Forward 359 mutation primer

<400> 12
catcttcagc ctgggactgt 20

<210> 13
<211> 610
<212> DNA
<213> Artificial Sequence

<220>
<223> A second human peripherin hybrid DNA with a A-->G change at nucle
otide 468

<220>
<221> misc_feature
<222> (1)..(610)
<223> n is any nucleotide.

<400> 13
tttttntggn tntcnaatta atacgactca ctatagggag acccaagctt ggtaccgagc 60

tcggatccac tagtaacggc cgccagtgtg ctggaattct tcancgccca ggaccaggac 120

tatcccctgc tcaagctgtg attccgagac ccctgccacc actactgcat tcacggggat 180

cccaggctag tgggactcga catgggtagc ccccagggca gctccctaca gcttgggcca 240

tctgcacttt tcccaaggcc ctaagtctcc gcctctgggc tcgttaaggt ttggggtggg 300

agctgtgctg tgggaagcaa cccggactac acttggcaag catggcgcta ctgaaagtca 360

agtttgacca gaaaaancgg gtcaagttgg gcccaagggc tctgggctcn atgnaaacct 420

nggtttcccc ccccctnttt gggctgggca tcatcatctt tcagcctggg antgttcctg 480

aanattgaac tcccaaagag ancgatgtga tgaataattc tgaaanccat tttgtgcccc 540

actcattgan aaggangggg tgnatcctgt ttcttcactc cctgntggaa aatgctacaa 600

nccctgaacc 610

<210> 14
<211> 679
<212> DNA
<213> Artificial Sequence

<220>
<223> Hammerhead ribozyme (termed Rz30) cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(679)
<223> n is any nucleotide.

<400> 14
cnttggtggt nctgtcggnt gtctatataa gcagagctct ctggctaact agaagaaccc 60

actgcttact ggcttatcga aattaatacg actcactata gggagaccca agcttacttt 120

cagctgatga gtccgtgagg acgaaagcgc catctagagg gccctattct atagtgtcac 180

ctaaatgcta gagctcgctg atcagcctcg actgtgcctt ctagttgcca gccatctgtt 240

gtttgccccc cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc 300

taataaaatg atgaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggggt 360

gggtggggca ngacancaag ggggaagatt gggaaaacaa tncccgcctg ctggggatgc 420

ggtgggctct atggcttctg aggcgaaana acnnctgggg tctnggggggt tcccncccccc 480

ctgtnncggc cttnanncgg gggttttgtg ntccccccnc ttancnntnn ttnnnnnncc 540

nnccccccnnc nntncnnttn ntccnnnnnn tncncnnntt nnnnngnntc cnnnnnnnnt 600

nnnnnggggc ncnnnngntc cnntnnnncc ncnnnnnncn nncnnnnnnn nntntgnngg 660

cccnnnncnn nnnnncncn 679

<210> 15
<211> 691
<212> DNA
<213> Artificial Sequence

<220>
<223> Hammerhead ribozyme (termed Rz31) cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(691)
<223> n is any nucleotide.

<400> 15
nntttntcct acgnccgttt taaananaac cagaccctct gganaattan atnnccactg 60

cttactggct tatcgaaatc aatacgactc actatangga gacccaagct tacagtccct 120

gatgagtccg tgaggacgaa aggctgaatc tanagggccc tattctatag tgtcacctaa 180

atgctagagc tcgctgatca gcctcgactg tgccttctaa ttgccagcca tctgttgttt 240

gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac tcccactgtc ctntcctaat 300

aaaatgatga nnttgcatcg cattgtctga gtaagtgtca ntctattctg gggggtgggg 360

tggggcanga cancaagggg gaagattggg aaaaacattn cacgcatgcc gggggatgcg 420

gtgggctctn ttngcntcng aaggcngaaa aaaacnactg gggccctang ggtnnccccnn 480

tccccccntgt aacngncctt naacncgggg gtttgtggtt nnccnanctt ancnctnaac 540

ttccnnccccc nnnccccccnc tcttcccttt ttcctccatc tccncntttn cccgntctcc 600

cttncactna aatgggggcc cctacngggn ctntntntct cttnnnnccn ccncccnana 660

natatnctng ntnnttcncc tctcggcccc t 691

<210> 16
<211> 805
<212> DNA
<213> mammalian

<220>
<221> misc_feature
<222> (1)..(805)
<223> n is any nucleotide

<220>
<221> misc_feature
<223> Human collagen 1A2 (B)

<400> 16
ntcncgncat ttaancaggc caggnctacc gcnnggtcca ngtaggccgg gagccccagc 60

aacgccggga aggccagcag cacccttggc accagtaagg ccgtttgctc caggattacc 120

angaggtcca acggggccgg agaggcctgg aanaccactt caccacgggg aaccggcggg 180

tccagtagga ccagcgttac caacagctcc aatttcaccc ttggggccag gggcacctgg 240

gaagcctgga nggccagcag accaatggga ccagcaggac cacggaccac acttccatca 300

ctgctttngc ncagctgggc aagggcacaa cacttctctc tcacangaac ccacggctcc 360

tgtttnactg aattccattt cacagggcac agttcacctt cacacaagaa cacggntgtc 420

cttcatcatc agacatgttt ccctaatgct tgagcagant cagattcagg aaacacacac 480

ctttgtccac atctctncac agtctcggtt tcaggtacac tcccacctgc agaggcactg 540

accaacctga gacattgaca ttncagncca cagtctgaac tgagcgggca cgccatggcn 600

agtcatacct gtcagnatca tcttctctta ncattcccaa ngggcagaat gaaagctgac 660

tccccaatgt cttattttta annanggttt naaanaannn nnnnnnnnnn nnnnnnnnnc 720

ccccccccct tngggtttat tatctatncn ncccntngga tatctttncc ccnttncccc 780

ctnaaanttt tnttnttttt tnnnn 805

<210> 17
<211> 797
<212> DNA
<213> mammalian

<220>
<221> misc_feature
<222> (1)..(797)
<223> n is any nucleotide

<220>
<221> misc_feature
<223> Human collagen 1A2 (A)

<400> 17
ccctttaaaa canggccagg aataccgcgg ggtccaggga ggccgggacc ccancaacgc 60

cgggaangcc cagcagcacc cttggcacca gtaangccgt ttgctccagg attaccagga 120

ggtccaacgg ggccggagan gcctggaaga ccacttcacc acggggaacg gcgggaccag 180

cangaccagc gttaccaaca gctccaattt cacccttggg gccaggggca cctgggaagc 240

ctgganggcc agcagaccaa tgggancagc aggaccacgg gaccacactt ccatcnctgc 300

cnctggcacc agctgggcaa gggcacaaca cttctctctc acnaagaacc cacggntcct 360

gtttaactga attccatttc acagggcaca gttcaccttc anacagaaca cgggtgtcct 420

tcatcatcaa acatntttcc tatnccttga gcagaatcag attcaggaac acacactttg 480

tcacatctcc tcacagtctc ggtttcaggt aacactcnca cctgcagagg cactgacnaa 540

nctcaganat ttanattccn ctccncagtt tgaacttagg cgggccctnn catttggntt 600

gtcctaacct ntngggggtt ttncttnnnn nnnnnnnttt nacnantccc aanggggana 660

ananagntga ctcctatgtc ttnttntnaa aaggtttttn aaaaattaac ccccccctn 720

ttgggttatt tatttttttt nnccccccctt ttgngaancn tnnccccntt ttccccnnna 780

aantttttn ttttttt 797

<210> 18
<211> 697
<212> DNA
<213> Artificial Sequence

<220>
<223> A hammerhead ribozyme (termed Rz907) cloned in pCDNA3

<220>
<221> misc_feature
<222> (1)..(697)
<223> n is any nucleotide

<400> 18
nctttcnntc tnatncatan aagcaggccc tctnnaaaaa ctanantttc cactgcttac 60

tggcttatcg aaancaatac gactcactat agggagaccc aagcttcggc ggctgatgag 120

tccgtgagga cgaaaccagc atctagaggg ccctattcta tagtgtcacc taaatgctag 180

agctcgctga tcagcctcga ctgtgccttc tagttgccag ccatctgttg tttgcccctc 240

ccccgtgcct tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga 300

ngaaattgca tcgcattgtc tgagtangtg tcattctatt ctgggggggtg gggtggggca 360

ngacancaag ggggaagatt gggaanacaa taacaggcat gctggggatg cggtgggctc 420

tatggcttct gaggcggaaa gaaccaactg gggctctang gggtatcccc acncccctgt 480

taccggcgca ttaancgcgg gggtgttgtg gttacccnca acttaacgct acacttgcca 540

cgcctaacgc ccctcctttc gcttcttcct tccttctccc acttccccgn tttcccttca 600

actctaatcg gggcncctta ggtccaatta atcttacggn cncacccaaa actnataggt 660

aagtccttnt ggcccccccaa aaaggttccc ctaaatg 697

<210> 19
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> Human rhodopsin unadapted sequence with ribozyme cleavage site

<400> 19
tacgtcaccg tccag 15

<210> 20
<211> 15
<212> DNA
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